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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,516	10/05/2005	Motoki Hiraoka	2886.0092-00000	5346

22852 7590 08/02/2010

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EXAMINER	
BAREFORD, KATHERINE A	

ART UNIT	PAPER NUMBER
1715	

MAIL DATE	DELIVERY MODE
08/02/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,516	HIRAOKA ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1715	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7 and 9-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7 and 9-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment of June 18, 2010 has been received and entered. With the entry of the amendment, claims 4 and 8 are canceled, and claims 1-3, 5-7 and 9-11 (including new claims 10-11) are pending for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-3, 5-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asakura et al (Japan 10-088361, hereinafter Asakura) in view of Iwasa et al (US 5803131), Mayne (US 4437999), Hattori et al (Japan 11-244360, hereinafter Hattori) and Inoue (Japan 55-145620, hereinafter Inoue).

Claims 1, 5: Asakura teaches a method of pretreating before electroless plating (paragraph [0006]). A resin material is irradiated with ultraviolet rays before electroless plating to help increase adhesion of the plating, by helping to oxidize and degrade the surface of the polymer (paragraphs [0006]—[0009]). No roughening treatment is required on the surface of the resin before the UV treatment (paragraphs [0003], [0004], [0010], [0015] and Table 1). After the UV treatment, electroless plating is provided. Paragraph [0014].

Asakura does not teach that the UV treatment is done while the resin material is in contact with a first solution containing ozone and a specific solvent as claimed. However, Iwasa teaches that a polymer surface can be desirably oxidized to prepare the surface for electroless plating by contacting the surface with an aqueous ozone solution (column 9, lines 45-65, column 10, lines 10-15, column 11, line 65 through column 12, line 35). Mayne further teaches that it is well known that simultaneously treating an organic resin material with a first solution containing ozone and UV light has the physical effect of oxidizing the resin, with the ultraviolet light serving to enhance appreciably the oxidation rate accomplished by the ozone (column 1, lines 5-20 and 55-65, column 2, lines 35-45, and column 4, lines 45-55). It would have been obvious to one

of ordinary skill in the art at the time the invention was made to modify Asakura to further provide that the resin material is in contact with an ozone solution as suggested by Iwasa and Mayne during the UV irradiation to provide a beneficial increased oxidation rate for speedy processing, as Asakura and Iwasa both teach the desire to oxidize resin surfaces before electroless plating, using UV treatment and an ozone solution, respectively, and Mayne teaching that the combination of these treatments would be expected to provide a beneficial enhanced oxidation rate.

As to the further use of the specific solvent other than water, Hattori teaches that by further providing an organic solvent, such as alcohol, for example, ethanol, with water in an ozone containing solution its oxidative powers are increased for use in treating polymers (see the Abstract and paragraphs [0004]—[0005], [0007], [0012], [0025]). Paragraph [0012] and Figure 1 of Hattori notes that when ethanol concentration is more than 10 volume % the solubility of ozone increases over that of water alone and this ozone level corresponds to oxidizing power. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Asukura in view of Iwasa and Mayne to further provide organic alcohol, such as ethanol (an organic polar solvent) in a concentration of more than 10 volume % to increase the solubility (dissolvability) of the ozone and increase the oxidizing power of the solution as taught by Hattori in order to further accelerate and increase the oxidation step. As worded in the claim, the presence of this ethanol would provide that at least some of the ozone would dissolve in the ethanol that is present, due to its

solubility in ethanol, and therefore, even if water is also present, a solution containing ozone dissolved in a organic polar solvent that is not water would be provided. Moreover, it is also the Examiner's position that it would have been obvious from the teaching of Hattori to perform routine experimentation to optimize the amount of ethanol used, up to 100 volume % (all ethanol/no water) to provide the optimum oxidation ability given the teaching of Hattori of increasing ozone solubility with increasing percentage of ethanol, showing that the amount of ethanol is a result effective variable, and "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, Inoue teaches that conventional use of either ethanol or methanol as an alcohol used to provide a oxidizing agent with ozone (abstract). It further would have been obvious to modify Asakura in view of Iwasa, Mayne and Hattori to use methanol as to the organic alcohol instead of ethanol as suggested by Inoue with an expectation of similar results because Hattori teaches to use an organic alcohol solvent, exemplifying ethanol, and Inoue teaches that methanol would be an organic alcohol used for a similar purpose and with an expectation of similar results as ethanol for providing an ozone containing solution.

Although applicant asserts unexpected results summarized in Table 1 of the specification, these results are not commensurate in scope with these claims to show that the results occur over the entire claimed range (see MPEP 716.02(d)). For example

(1) applicant's table provides one example of nitric acid (and does not say how much/strength is used -- i.e. is the solution 100% nitric acid, 60% nitric acid/40% water, etc.) and one example of ethanol (and does not say if this is entirely ethanol), while applicant's claims claim a specific list of organic or inorganic polar solvents (that does not include ethanol) with no indication that the same results will occur for every inorganic/organic solvent listed; (2) applicant claims a resin material in general can be treated, but only uses an ABS substrate in the examples, with no indication that the same results will occur for every resin.

Claims 2-3 and 6-7: Asakura further teaches that after the UV treatment, the resin material is brought into contact with a second solution containing an alkaline component and a nonionic surface active agent (surfactant) to help improve plating adhesion (paragraphs [0005] – [0006], [0011] and [0013]).

Claim 9: After the electroless plating step, Asakura indicates that an electroplating step can be provided (paragraph [0017]). Iwasa further indicates that it is conventional to provide an electroplating step after electroless plating (column 10, lines 10-15).

5. Claims 1-3, 5-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asakura et al (Japan 10-088361, hereinafter Asakura) in view of Iwasa et al (US 5803131) and Nakajima et al (Japan 2002-025971, hereinafter Nakajima).

Claims 1, 5: Asakura teaches a method of pretreating before electroless plating (paragraph [0006]). A resin material is irradiated with ultraviolet rays before electroless plating to help increase adhesion of the plating, by helping to oxidize and degrade the surface of the polymer (paragraphs [0006]—[0009]). No roughening treatment is required on the surface of the resin before the UV treatment (paragraphs [0003], [0004], [0010], [0015] and Table 1). After the UV treatment, electroless plating is provided. Paragraph [0014].

Asakura does not teach that the UV treatment is done while the resin material is in contact with a first solution containing ozone and a specific solvent as claimed. However, Iwasa teaches that a polymer surface can be desirably oxidized to prepare the surface for electroless plating by contacting the surface with an aqueous ozone solution (column 9, lines 45-65, column 10, lines 10-15, column 11, line 65 through column 12, line 35). Nakajima further teaches that is well known that simultaneously treating an organic material with a first solution containing ozone and UV can heighten oxidative degradation capability of the ozone water (see paragraphs [0011]—[0015]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Asakura to further provide that the resin material is in contact with an ozone solution as suggested by Iwasa and Nakajima during the UV irradiation to provide a beneficial increased oxidation rate for speedy processing, as Asakura and Iwasa both teach the desire to oxidize resin surfaces before electroless plating, using UV treatment

and an ozone solution, respectively, and Nakajima teaching that the combination of these treatments would be expected to provide a beneficial enhanced oxidation rate.

As to the further use of the specific solvent other than water, Nakajima further provides that by further providing an organic solvent, such as acetic acid, with water in an ozone containing solution its oxidative powder are increased for use in treating organic material because it controls decomposition of the ozone (paragraphs [0014], [0015], [0020]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Asukura in view of Iwasa and Nakajima to further provide acetic acid (an organic polar solvent) to prevent ozone decomposition as taught by Nakajima in order to further accelerate and increase the oxidation step. As worded in the claim, the presence of this acetic acid (which can be in an amount of 0.01 mol/L, for example, Nakajima, paragraph [0056]) would provide that at least some of the ozone would dissolve in the acetic acid that is present, due to its solubility in acetic acid, and therefore, even if water is also present, a solution containing ozone dissolved in a organic polar solvent that is not water would be provided. Moreover, it is also the Examiner's position that it would have been obvious from the teaching of Nakajima to perform routine experimentation to optimize the amount of acetic acid used, up to 100 volume % (all acetic acid/no water) to provide the optimum oxidation ability by preventing ozone degradation, given the teaching of Nakajima of controlling the ozone degradation, showing that the amount of acetic acid is a result effective variable, and "[W]here the general conditions of a claim are disclosed in the prior art, it is not

inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Although applicant asserts unexpected results summarized in Table 1 of the specification, these results are not commensurate in scope with these claims to show that the results occur over the entire claimed range (see MPEP 716.02(d)). For example (1) applicant's table provides one example of nitric acid (and does not say how much/strength is used -- i.e. is the solution 100% nitric acid, 60% nitric acid/40% water, etc.) and one example of ethanol (and does not say if this is entirely ethanol), while applicant's claims claim a specific list of organic or inorganic polar solvents (that does not include ethanol) with no indication that the same results will occur for every inorganic/organic solvent listed; (2) applicant claims a resin material in general can be treated, but only uses an ABS substrate in the examples, with no indication that the same results will occur for every resin.

Claims 2-3 and 6-7: Asakura further teaches that after the UV treatment, the resin material is brought into contact with a second solution containing an alkaline component and a nonionic surface active agent (surfactant) to help improve plating adhesion (paragraphs [0005]—[0006], [0011] and [0013]).

Claim 9: After the electroless plating step, Asakura indicates that an electroplating step can be provided (paragraph [0017]). Iwasa further indicates that it is conventional to provide an electroplating step after electroless plating (column 10, lines 10-15).

Claims 10-11: Nakajima provides that the organic polar solvent can be acetic acid (paragraph [0020).

Response to Arguments

6. Applicant's arguments filed June 18, 2010 have been fully considered but they are not persuasive.

(A) As to the rejection of claims 1-3, 5-7 and 9 using Asakura in view of Iwasa, Mayne, Hattori and Inoue, applicant argues that (a) it would not be obvious to combine Asakura and Iwasa because Iwasa provides that the surface has prior roughening before the ozone solution treatment. The Examiner disagrees. While Iwasa describes a roughening step at column 8, lines 58-60, Iwasa goes on to describe that treatment with a first neutralizing step (the ozone treatment step), and provides that this step "is the essential feature of the second embodiment." (column 8, lines 60-64). From this teaching, one of ordinary skill in the art would understand that this is the required step of the process taught by Iwasa, and other steps are not "essential", and do not necessarily have to be performed, especially as the primary reference, Asakura indicates that when providing UV treatment, which will be in the combined invention, roughening is not necessary. (b) Applicant further argues that it would be improper to combine Mayne with the other references, since Mayne is directed to using water as a solvent. The Examiner disagrees. Firstly, as noted in the rejection, the claims allow for the presence of water and ethanol (organic polar solvent) as solvents, and Inoue

describes the use of a solvent of both water and ethanol, which would thus have the same evaporative issues as to water that Mayne provides. Moreover, even if all ethanol was used as the solvent to start, and if some water was added to the solvent from oxidation of the organic material the process would still be expected to work, since the UV treatment is described as enhancing the ozone action in Mayne (column 4, lines 45-50), which ozone would still be present, and as shown by Inoue can be in ethanol/water mixes. (c) Applicant further argues that Mayne teaches a longer UV treatment than Asakura, and one would not apply Mayne's teachings to Asakura's much shorter UV treatment. The Examiner disagrees. Mayne's time is for degradating the bulk of the material (see column 5, lines 40-55), while Asakura's is only a surface treatment, so naturally would be expected to take a far shorter amount of time. (d) Applicant argues that neither Hattori or Inoue suggest disclose or suggest using ozone in alcohol solvent for a treatment method for electroless plating. However, it is the Examiner's position that Hattori and Inoue provide the suggestion that oxidation effect would improve by adding alcohol, and the references to Asakura and Iwasa indicates that it is an oxidation effect that is desired. Thus, the combination of the references provides the suggestion of using the alcohol solvent. As to applicant's showing in the specification and Table 1 of benefits, the Examiner maintains her position that a showing of unexpected benefits has not been provided for the reasons discussed in the rejection above.

(B) As to the newly provided rejection of claims 1-3, 5-7 and 9-11 using Asakura, Iwasa and Nakajima, this was provided in response to applicant's amending of the

claims to provide new claims 10-11 to require a different combination of possible organic solvents. Nakajima has been provided as to the suggested use of acetic acid as discussed above.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1715